Statewide/Regional Plan Integration Questions:

Please keep in mind that this is not an exhaustive list, but is intended to guide discussion by PEVCC members.

General Questions

- In what ways can the state plan assist and support regional PEV planning efforts?
- The State could and should support local agencies and Council of Governments (COGs) and regional PEV efforts by providing funding for local resources and expertise or "Strike Teams." The CEC and DOE's Clean Cities have provided significant funding for the Southern California Associations of Governments' (SCAG) Plug-in Electric Vehicle (PEV) Collaborative. In this region, the SCAG and the South Coast AQMD have funded a vast body of work by UCLA's Luskin Center.
- Currently there are few PEV "experts." Each jurisdiction, and sometimes, each neighborhood, is unique. Despite a current lack of local PEV experts with help from the Luskin Center, local utilities, a neighboring City or County with expertise, SCAG and/or the South Coast Air Quality Management District, local agencies can obtain the assistance needed. And in time, the local agency can and will develop their own staff and their own expertise. State funding for expertise from the Luskin Center and or other local agencies is critical to accelerating local agency plans, staff development and expertise.
- Recommendation: The State should identify, marshal, and provide funding for regional resources and expertise to assist local agencies. The State should fund these regional "strike teams" to assist local agencies and communities with their PEV readiness, planning, and implementation.
- Should there be certain templates or standard measures used for each CEC-funded local plan, to ensure that the local plans can fit into the larger statewide plan?

Sharing Planning Data/Best Practices

- What venues need to be established for regions to share information about infrastructure planning?

- In addition to local government and industry, what other groups (academia, NGOs, property owners) are important in California PEV planning?
- Venues that need to be established within each region include: Local Council of Governments (COGs); colleges and universities; property managers associations; large real estate firms (Coldwell Banker, CB Richard Ellis, etc.); parking lot firms and associatons; and large employers – those with 200 or more employees at a given site.

EVSE Interoperability:

- Should measures be taken to ensure that any PEV driver can use any charging station, regardless of their network membership? If so, what measures could ensure such access? *Short answer:* ***YES.***
- The current network model - specifically the ChargePoint (formerly Coulomb Technologies), Blink (ECOtality), etc. - is economically unsustainable. So are the business models of CarCharging and 350 Green.

  Those purchasing Plug-in EVs are well educated and environmentally conscious. This year, Plug-in hybrids (PHEVs) were the majority of Plug-ins Vehicles sold in California. I believe Plug-in Hybrids will continue to be the majority of Plug-ins sold in California in the next few years. Drivers will quickly do the math - $2 per hour for a vehicle with a 3.3 kWh or $0.49 per kWh will turn off drivers. It will be much cheaper to drive on gasoline than electricity. These PHEV vehicles could suffer the same fate as bi-fueled and flex-fueled vehicles in California. If this happens, the network operators and car charging enterprises will see their revenues remain static or decline because their pricing is not competitive with gasoline.
- Access to EVSE should be up to the site owner. Some EVSE may be fleet only charging, employee (workplace) only charging, and/or tenant and/or guest only charging. If an EVSE available/open to the public, it should not require the user to be a member of a particular network.
- I currently carry cards for two networks. When NRG comes to town, will I have to carry a third? Personally, I don't want to be a member of a network. But sometimes, I need to charge my LEAF. While I chose to belong to Costco, I would not chose to belong to multiple discreet networks so that I could purchase fuel for a gasoline-powered vehicle at an Arco, Chevron, Shell, Valero, etc.
- There should be **no** further government funding (such as AB 118 funding) of various private network (Coulomb – now ChargePoint, ECOtality, AV, NRG, etc.) EVSE.
- The State should **not** provide any further funding to any of those who have created this issue for the purpose of resolving this issue. I believe that one or more of these firms may seek to make THEIR network the defacto industry standard. If the State wishes to facilitate this, it would be wrong on many levels.
- The State should only fund open source EVSE activated by a credit card, Google Wallet, Pay-by-Phone, or some other universal method. If the State were to commit the next two years funding ($5 million each year) in EV Infrastructure spending to EVSE installations with an open source payment method, it would both ensure open access and change the landscape. And it would solve the Interoperability "problem" and should lower the cost of public charging.
- Private network memberships greatly inhibit access to EVSE in public places, such as workplace charging and/or public parking lots. Funding these private networks only perpetuates the problem. If one or more of these closed

ecosystems goes bankrupt or goes out of business, the software (and possibly the hardware) will have to be replaced. EVSE operated by credit cards, electronic wallets, and/or pay-by-phone will not suffer the same fate.

- The State should actively participate in and advocate for the development of open source systems, as advocated by Open Charge Point Protocol (OCCP - http://www.ocpp.nl/). Many of the major EVSE manufacturers are currently part of this movement.
- Currently, one can use one of four major credit cards at most retail locations. Accessing an EVSE must be equally simple. In the short term, private networks may make business sense for their system providers, but they are far too expensive and I believe, limit/inhibit the use of public EVSE.
- Sales of Plug-in Hybirds (PHEVs) have taken off and, I believe, will far outpace the sales of Plug-in Electric Vehicles (PEV) in the next two years. PHEV drivers will quickly figure out that $2 per hour for an EVSE (for 15 miles in a Plug-in Prius) equals more than $6 per gallon. If we are trying to accelerate the shift to the Electrification of Transportation, costs for electricity must be less than or equal to its gasoline equivalent – not significantly more. While the various Network Solutions provide a lot of data, and one provides an elegant solution, ultimately these costly Network Solutions will be limited by drivers' willingness to pay. They may only be used when a driver is out of charge or is willing to pay far MORE for electricity than its gasoline equivalent.

- What role should government play ensuring interoperability?
- Limit future government EVSE funding to EVSE that don't perpetuate the Interoperability issue/problem.
- If membership networks are to continue, create a timeline by setting a sunset on membership networks for publicly available EVSE. For example, by January 1, 2015, any EVSE available/open to the public must have a common payment method – i.e. credit card, pay-by-phone, electronic (Google) wallet, etc. Memberships could still be offered, but only if they provide either a discounted rate for use or an "all you can use" for single monthly price.

State Support for EVSE Installations

- Is financial support needed from the state for EVSE installations in the following locations: *Short answer:* ***YES***
  - Residential
  - Workplace
  - Multiunit Dwellings
  - Public

- If support is needed, what type of investment should the state make (e.g. incentives vs. loans)?
- In addition should locations be prioritized (residential vs. workplace)?

- There are three places where charging is needed: At Home (single family and multi-family), At Work, and At Destinations - think of a three legged stool.
- The majority of those who live in a single family home will install a Level 2 EVSE. Some kind of credit for the purchase and installation of a 30 Amp or higher Level 2 charger of up to 50% of the cost of the Charger and Installation (not to exceed $1,000 per personal tax return) would be very helpful. (The 30 Amp Level 2 is capable of 6.6 kWh to 7.2 kWh. A 16 Amp Level 2 is limited to 3.3 kWh.) A similar rebate or tax credit for up to half the cost of a 16 Amp Level 2 (not to exceed $500) would also be a good idea. Local Air Districts should be allowed to provide additional incentives through the Clean Car Rebate Program.
- Multi-Family is the most difficult location to solve. Within Los Angeles County, about 42% of the residences are multi-family. But in some communities, such as Santa Monica, multi-family units are more than 75% of the housing stock. In older multi-family dwellings, the electrical panels may not support more than some limited Level 1 charging. Several solutions are needed to expand the availability of home charging for multi-family:
  - During a new design or a major remodel, require that a building's panel be upgraded to incorporate an additional 40% extra capacity for the garage area. (Major remodel would be defined as more than 35% of the square footage, or during the installation of and/or replacement of air conditioning systems).
  - Multiplexing and/or cord sharing technologies, such as those being developed at UCLA's Smart Grid Program could make a significant difference in multi-family dwellings. Multiplexing and/or cord sharing will allow up to four vehicles to share a Level 1 or a Level 2 EVSE. The State should fund hundreds of demonstration pilots at larger multi-family complexes, with at least 50% of these pilots in non-attainment regions. These multiplexing and/or cord sharing technologies are currently being UL Listed.
  - Again, provide some form of credit to the building owner (through the Clean Vehicle Rebate Program) for up to 50% of the EVSE equipment cost, not to exceed $1,000 per EVSE, or $2,500 for a multiplex or multi-cord Level 2 model.
- Worksites, especially those with more than 200 employees, represent yet another significant opportunity, as well as a challenge. These worksites can also be destinations. For example, large office complexes, courthouses, colleges and universities, etc. The County of Los Angeles has 101,000 employees. More than 40,000 employees work at approximately 70 sites. The typical employees' commute one way is 24 miles. The largest sources of Green House Gas (GHG) emissions is the energy needed to heat, light, and cool our 2,600+ buildings. The County employees' commute represents the second largest source of GHG emissions (32% of the total GHG emissions). In Alameda County, the employees' commute is that County's largest source of GHG emissions (Scope 3 emissions).
- When/If County employees' commute on electric miles, the County can realize a dramatic reduction in GHGs and criteria pollutants. The two challenges are to

provide a sufficient number EVSE at each of the County's 70 large employment worksites and to minimize the charging costs to our employees. Many of the parking facilities are outdated – built in the middle of the last century. The typical membership network charges by the hour rather than by the kilowatt hour. When the network/membership fees are added, the cost of charging can dwarf to cost of gasoline.

- Multiplexing and/or cord sharing technologies, such as those being developed at UCLA's Smart Grid Program will allow up to four vehicles to share a Level 1 or a Level 2 charger. Multiplexing and/or cord sharing technologies are currently being UL Listed. The State should fund hundreds of demonstration pilots at major worksites. At least 50% of these worksite pilots should be in non-attainment regions with high PEV adoption rates.
- Encourage employers to provide workplace charging as a pre-tax benefit, similar to Transit Passes.
- Encourage businesses to support/subsidize the building owner's EVSE energy usage through advertising – "Charging Provided Compliments of Daddy Warbucks' Coffee, located on the Second Level." Energy costs for Multiplexed or Cord Sharing solutions would be minimal.

- The parking areas in many worksites and multi-family residents have very limited electrical infrastructure. Encourage a holistic solution – leveraging existing funding for lighting upgrades with supplemental funding to replace conventional and/or fluorescent lighting with advanced LED lighting to reduce loads and free up capacity on existing electrical panels to enable vehicle charging.